AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1 to 10. (Canceled).

10. (Currently Amended) A method for monitoring transmission quality of an optical signal in an optical transmission system, the method comprising:

plotting an amplitude histogram of the optical signal transmitted over the optical transmission system;

classifying the amplitude histogram of the optical signal according to at least one of bit error rates and fault causes by ~~performing at least one of:~~

~~(i)~~ acquiring input data from the amplitude histogram,

feeding the input data to a neural network,

generating at least one output value from the input data, and

assigning the at least one output value to at least one of: the bit-error rates of the optical signal; and

~~ii) assigning the at least one output value to at least one of~~ the fault causes of the optical signal.

11. (Previously Presented) The method of claim 10, wherein the optical transmission system includes an optical wavelength division-multiplex network.

12. (Previously Presented) The method of claim 10, further comprising:

preprocessing the amplitude histogram so that the amplitude histogram is a normalized amplitude histogram before presenting the amplitude histogram to the neural network;

selecting a predefined number of data from the normalized amplitude histogram for providing a number of selected data; and

feeding the number of selected data to at least one input neuron of the neural network, wherein the number of selected data corresponds to a number of the at least one input neuron.

13. (Previously Presented) The method of claim 10, further comprising:

asynchronously sampling the optical signal following an optoelectronic conversion to obtain at least one sampled value; and

entering at least one sampled value into the amplitude histogram.

14. (Previously Presented) The method of claim 13, wherein a length of a time slot used for the sampling of the optical signal is adapted to a data transmission rate so that rapid oscillations in an amplitude of the optical signal are detectable and are not averaged out.

15. (Previously Presented) The method of claim 14, wherein the length of the time slot is on the order of picoseconds.

16. (Previously Presented) The method of claim 10, wherein the optical signal is transmitted with a predefined fundamental wavelength over an optical channel for a wavelength-division multiplex network.

17. (Previously Presented) The method of claim 10, wherein the neural network includes a multi-layer perceptron that has undergone a training using at least one training data set having a known output value and using at least one of a cascade correlation training method and a resilient backpropagation training method.

18. (Previously Presented) The method of claim 10, wherein the at least one fault cause of the optical signal includes at least one of noise, cross-talk and signal distortions.